ARMY
SBIR PHASE II

2004

QUALITY
AWARDS

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SBIR PHASE II

Bare Earth Models & Feature Extraction from Light Detection & Ranging (LIDAR) Technologies

Spectrum Mapping, LLC. - Denver, Colorado

U.S. Army Engineer Research and Development Center

The Army's ability to manage and process high resolution Light Detection and Ranging (LIDAR) data is vital to full exploitation. Spectrum Mapping applied several innovative approaches that are supported by its LIDAR Mapping and Analysis System (LID-MAS) software. LID-MAS provides a method to efficiently manage and map terrain in 3-D using LIDAR data and allows soldiers to easily import, display, and process various formats within a production environment. LIDAR reflectance features, such as bare earth, buildings, vegetation canopies and roads, can be extracted and exported for used in various terrain tasks. These include Homeland Security urban-based datasets and military applications such as MOUT, mobility, line of sight/visibility analyses and 3-D visualization. Filtering algorithms were delivered to Z/I Imaging and Intergraph for a planned commercial release in late 2004.
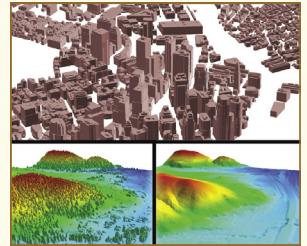
Countermine Operations

Planning Systems, Inc. - Reston, Virginia

U.S. Army Communications-Electronics Research, Development and Engineering Center

Buried anti-tank mines, off-route mines and Improvised Explosive Devices (IED) constitute major threats to Army vehicles. To detect these weapons at standoff distances (8-30 meters depending on threat type and concealment), Planning Systems has developed Forward-Looking Synthetic Aperture Ground Penetrating Radar. The system produces real-time images of threat objects while moving at speeds of 20-30 kph. Tests against actual mines indicate that the system can detect buried metallic and plastic anti-tank mines, certain types of IED and side-attack mines. The total electronics package weighs less than 300 pounds. Planned improvements include extending the detection range, speed of advance, and improved performance against IED.

Rapid Water Testing

Pacific Technologies - Redmond, Washington

U.S. Army Medical Research and Materiel Command

Quickly establishing sources of potable water significantly enhances the ability of deployed forces to sustain themselves. The Pacific Technologies "Coliform Analyzer" identifies bacteriological water contamination in eight hours or less versus present systems that give results in 24 hours. The eight-pound system provides a simplified assay approach that integrates water-filtration, microbial culture, and automated readout of E. coli and Coliform bacterial contamination results for eight water samples simultaneously. The technology has widespread application for inspection of recreational and municipal water supplies, and testing for contaminants in commercial sectors spanning agriculture, electronics, and pharmaceuticals.
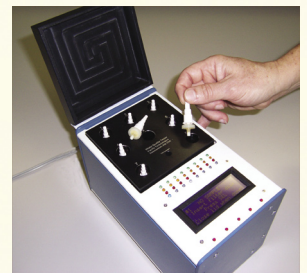
Large Quantity Carbon Nanotube Production

NanoLab, Inc. - Newton, Massachusetts

U.S. Army Research Laboratory

Because of the high strength, low density, and unique electrical and thermal conductivity properties of carbon nanotubes, the Army has sought to take advantage of this new technology while reducing cost and increasing supply. NanoLab created a chemical vapor deposition reaction chamber that continually synthesizes carbon nanotubes of pre-determined diameter, length and higher quality at a very low cost - less than $100/gram, a savings of over $900/gram. These quantities of low-cost carbon nanotubes have allowed researchers to investigate their properties in a variety of systems and applications including polymer reinforcement and ceramic armor toughening. NanoLab continues to scale up this process and has become a supplier to many DOD and Federal programs.
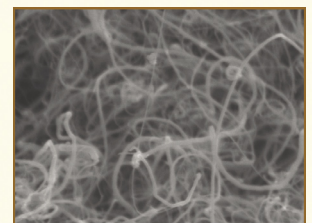
2004
QUALITY AWARDS

Successful Ultra-Wideband Communications

Time Domain Corporation - Huntsville, Alabama
U.S. Army Aviation and Missile Research, Development and Engineering Center

A reliable communications link to transmit data and video that is covert and immune to multipath interference is essential to realizing the full operational potential of military and commercial Unmanned Aerial Vehicles (UAVs). Time Domain Corporation (TDC) successfully demonstrated the transmission of live video from a UAV nose-mounted camera to a ground station at ranges up to 800 meters using Ultra-Wideband (UWB) radios as the link. TDC also demonstrated a communications relay link using three UWB radios to transmit over a distance of 1.5 kilometers. This radio relay capability allows for covert, robust non-line of sight communications links. TDC's UWB technology provides rapidly deployable, robust and covert communications networks for military and commercial applications.

Flexible Photovoltaics for Fabric Structures

Iowa Thin Film Technologies - Boone, Iowa
U.S. Army Natick Soldier Center

The demand for electrical power in portable and temporary installations adds significant logistical burden in terms of weight, maintenance and fuel. Iowa Thin Film Technologies has developed a flexible, thin film photovoltaic (PV) material in collaboration with Eureka! (a division of Johnson Outdoors) and FTL Design Engineering Studio. Researchers incorporated this PV technology into tents that are capable of supplying electrical power for command and control, lighting and communications. Products include a small, versatile shade that supplies 190W of PV power; a substitute for the 16-foot TEMPER military shelter that supplies 760W of PV power; and a stand-alone Power Shade that can reduce heat load and provide 1 KW of PV power.

Developing Effective Decision-Making Skills

ScenPro, Inc. - Richardson, Texas
U.S. Army Research Institute

ScenPro developed the Virtual Soldier Skills Assessment (ViSSA) system to enhance the Army's ability to teach cognitive decision-making skills using the virtual environment. While most virtual environment R&D is concentrated on 3-D graphics technology, ScenPro concentrated its efforts on an extensive evaluation of existing government off-the-shelf modeling and simulation software, immersive virtual technologies, and cognitive decision-making training methods that could be combined and adapted to the virtual environment. As the Army adopts virtual environments for the Future Force, the deployment of these systems will provide high quality "just-in-time" and refresher training at a low cost.

Analysis and Optimization of Military Incinerators

Reaction Engineering International - Salt Lake City, Utah
U.S. Army Research Office

The Army has responsibility for disposal of toxic chemical agents and munitions in the U.S. Chemical Weapons Stockpile and most of these materials will be destroyed by controlled incineration. Reaction Engineering International developed advanced computer simulation tools to analyze the performance of and emissions from military incinerators. The tools use furnace models configured specifically for military incinerators and include newly developed, fundamentally based chemical kinetic models for chemical warfare agent decomposition. The tools are used to optimize operations, anticipate and diagnose furnace upsets, and establish procedures for processing problematic munitions, thereby supporting the destruction of the Chemical Weapons Stockpile in a safe, timely, environmentally sound and cost-effective manner.
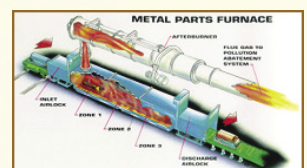
Army SBIR Phase II Quality Awards

The Army SBIR Program sponsors an annual Quality Awards Program that recognizes exceptional Army SBIR Phase II projects. Each year, a distinguished panel of Army and industry experts selects the winning projects from nominations submitted from across the Army.

During the 03.2 Solicitation, the Army received nearly 4000 Phase I proposals, of which 352 were chosen for Phase I award. During the same fiscal year, the Army invited and received 400 Phase II proposals, of which 222 were selected for award.

This year, as in the past, the Quality Awards competition was keen. The Army received 38 Quality Award nominations and selected eight winning projects. These eight projects represent the best in technology innovation, relevance to the needs of the Army, and commercialization potential.

In recognition of their accomplishments, the winners and their projects are showcased at Army and small business conferences and symposia throughout the year via this Army SBIR Phase II Quality Awards brochure.

2004 Winners

Flexible Photovoltaics for Fabric Structures: Iowa Thin Film Technologies
Large Quantity Carbon Nanotube Production: NanoLab, Inc.
Rapid Water Testing: Pacific Technologies
Countermine Operations: Planning Systems, Inc.
Analysis and Optimization of Military Incinerators: Reaction Engineering International
Developing Effective Decision-Making Skills: ScenPro, Inc.
Bare Earth Models & Feature Extraction from Light Detection & Ranging (LIDAR) Technologies:
Spectrum Mapping, LLC.
Successful Ultra-Wideband Communications: Time Domain Corporation

The SBIR Program

Congress initiated the SBIR Program in 1982 to increase small business participation in federal research and development. Successful Army SBIR research efforts move through three phases:

- Phase I: Feasibility Study, which lasts up to six months and is funded for up to $70,000 with a $50,000 option available.
- Phase II: Research and Development, which lasts up to two years for up to $730,000.
- Phase III: Commercialization, which requires funding from the private sector or non-SBIR program sources.

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